

Abstract Submitted
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Impact of droplets on surfaces of immiscible liquid films¹

ZHIZHAO CHE, Tianjin University, China, OMAR K. MATAR, Imperial College London — The impact of droplets on surfaces of immiscible liquid films is studied experimentally using high-speed photography. We found that the impact dynamics is significantly affected by the presence of the interface formed between the droplet and the liquid film. The impact of a water droplet on an oil film leads to the formation of a compound crown followed by a central jet. By varying the impact speed of the droplet, different impact outcomes are analysed, including bouncing, deposition, and oscillation of the impact droplet, the formation and the collapse of the compound crown, and the formation and tip-pinching of the central jet. The effects of key parameters controlling the impact process are discussed, such as the Weber number and the Ohnesorge number of the droplet, the viscosity ratio between the two immiscible fluids, and the film thickness.

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Omar Matar
Imperial College London

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